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Original Article

EVALUATION OF PSYCHOLOGICAL FACTORS IN ORTHODONTIC PATIENTS WITH TMD AS APPLIED TO THE "TMJ SCALE"

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Abstract

Physical and psychological evaluation have been required for TMD patients whose problems are multi dimensional. The questionnaire named the "TMJ Scale" was created to differentiate subjective TMD symptoms of patients. The purpose of this study was to clarify the reliability of the TMJ Scale for Japanese orthodontic patients with TMD and to differentiate the symptoms. Fifty orthodontic patients (average age 21y4m) with a chief complaint of TMD symptoms were compared with thirty patients (average age 21y1m) without TMD symptoms. The results were as follows: female patients in the symptom group in particular showed a higher degree of stress due to the chronic pain and abnormalities than those in the non- symptom group. Significant differences were observed in Pain Report, Joint Dysfunction and Global Scale at the 0.1% significant level, in Non-TM Disorder, Psychological Factor and Chronicity at the 1% level, and in Palpation Pain and Perceived Malocclusion at the 5% level in females. Few psychological problems were observed in male patients in the symptom group. Significant differences were observed in Range of Motion limitation at the 5% level in males. The differences in the psychological factors between male and female patients were clarified by using the TMJ Scale. These findings suggested that it was useful to differentiate the multiple symptoms, especially the psychological factors, by using the TMJ Scale for orthodontic patients with TMD.

Key words: TMD — Questionnaire — Psychological factor — TMJ Scale

INTRODUCTION

Diagnostic instrumentation for temporomandibular disorder (TMD) is increasing in part because the rapid rise in personal injury and malpractice litigation. Several research efforts have found that TMD patients share pretreatment characteristics with non-TMD

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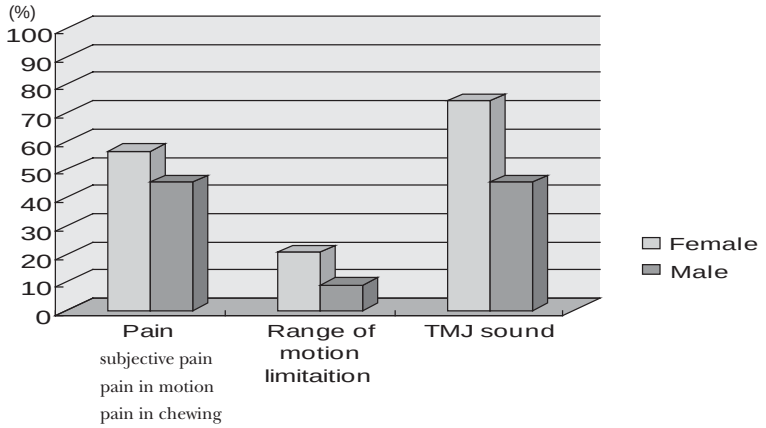

Fig. 1 TMD (+) chief complaint

Table 1 Number and ages of subjects

	Symptom group	Non-symptom group	Total
Male	11 (22y1m ± 3y8m)	11 (21y10m ± 4y1m)	22 (21y11m ± 3y11m)
Female	39 (21y5m ± 6y7m)	19 (20y8m ± 4y8m)	58 (21y10m ± 6y4m)

chronic pain patients[8]. Pamela found that the SCL-90R depression and anxiety scale, which is a kind of questionnaire, did not differentiate between orofacial pain patients and normals[11]. A questionnaire named the "TMJ Scale" developed by the Pain Resource Center in U.S.A. is known to evaluate and predict physical and psychological factors in patients with TMD subjective symptoms through out the treatment[1–3,6,9]. Objective evaluation of psychological factors for orthodontic patients with a chief complaint of TMD symptoms is needed, because their complaints are often multi-dimensional. The purpose of this study was to clarify the reliability of the TMJ Scale for Japanese orthodontic patients with TMD and to differentiate the symptoms.

SUBJECTS AND METHODS

Fifty patients aged 14 to 38 years old (11 males and 39 females; average age 21y4m ± 6y9m) with a chief complaint of TMD who consulted the Department of Orthodontics at Tokyo Dental College were used as the symptom group (Fig. 1). Thirty people aged 18 to 25 years old (11 males and 19 females; average age 21y1m ± 5y3m) who had no previous TMD symptoms or present symptoms were used as the non-symptom group (Table 1). No significant difference was seen between the male age and the female age. TMJ Scale is a questionnaire consisting of 97 questions with 5 alternatives for each answer. There are 5 items: Pain Report (PR), Palpation Pain (PP), Perceived Malocclusion (MO), Joint Dysfunction (JD), and Range of Motion Limitation (RL) with regard to the physical evaluation by the TMJ Scale.

The psychosocial evaluation items are Psychological Factors (PF), Stress (ST), and Chronicity (CN). Non-TM Disorder (NT) is an item to confirm the presence of problems other than the orofacial region, and Global

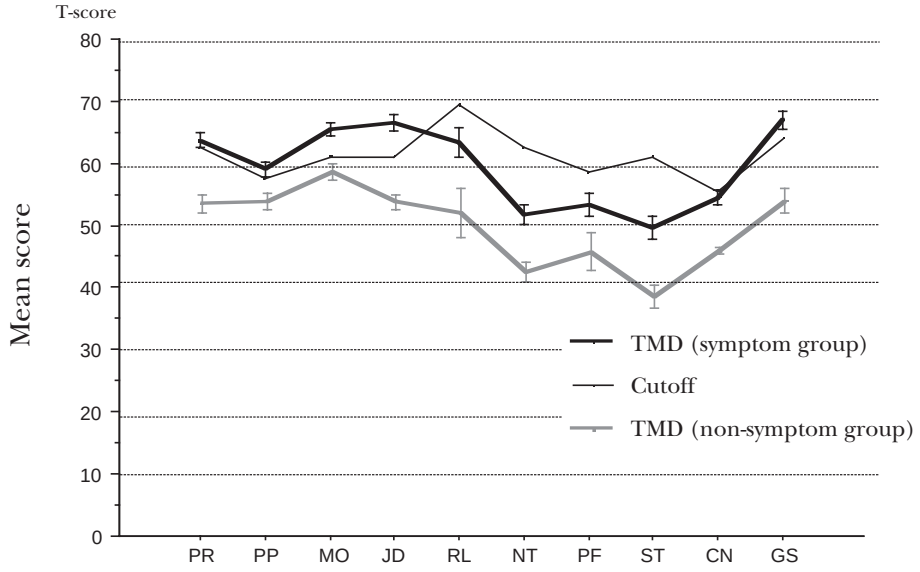

Fig. 2 Comparison of TMJ Scale scores in the symptom and non-symptom groups (Female)

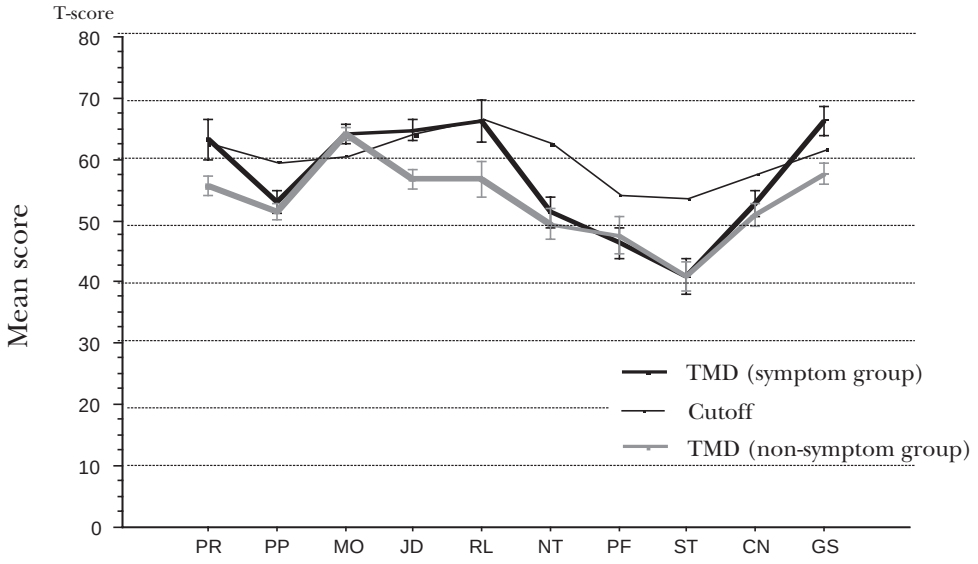

Fig. 3 Comparison of TMJ Scale scores in the symptom and non-symptom groups (Male)

(GS) is an item to evaluate comprehensively the presence of TMD symptoms.

The questionnaires were analyzed by US Resource Center (cooperation by Balvison Corp, Japan) between the two groups, and the scores were evaluated statistically.

RESULTS

The average score and its standard deviation of the TMJ Scale were indicated (Figs. 2,3). The female patients in the symptom group showed a higher degree in each item

Table 2 Significance level

	PR	PP	MO	JD	RL	NT	PF	ST	CN	GS
Female (symptom and non-symptom group)	★★★	★	★★	★★★	★	★★		★★	★★	★★★
Male (symptom and non-symptom group)				★						

Significance level: ★ 5%, ★★ 1%, ★★★ 0.1%

than those in the non-symptom group. Significant differences were observed in PR, JD, and GS at the 0.1% significant level, in NT, PF and CN at the 1% level, and in PP and MO at the 5% level in females (Table 2). The values of RL, NT, and PF and ST were lower than the cutoff[10] values, even in the female symptom group. The value of MO was higher than the cutoff value in both groups in males. Significant differences were observed only in JD in males (Table 2). If a patient's score is at or above the cutoff, the patient may have a clinically significant problem in this symptom area.

DISCUSSION

The TMJ Scale was developed by Lundeen and Levitt[6]. The studies were based on almost 3,000 subjects studied by 30 clinicians in United States and Canada. Rigorous cross-validation studies have demonstrated that the TMJ Scale has sufficient stability, generalizability, and accuracy to be used with reasonable confidence[2,7]. The characteristics of the TMJ Scale include repeated asking of the same question to be sure of the answers of the patients. Levitt[3,5] and Levitt *et al.*[4] investigated the values of the TMJ Scale for patients with TMD before and after treatment and reported that the TMJ Scale was useful for clinical diagnosis, understanding the symptoms of TMD, and the evaluation of changes in the symptoms between before and after treatment. Spiegel and Levitt[13,14] investigated the values of the TMJ Scale for patients with TMD before and after treatment and reported that the values of all the items except Perceived Malocclusion decreased, showing the reliability of the TMJ Scale. Levitt also reported that the scale was useful for evaluating the psychological problems and the degree of stress in patients. Pocock[12] compared the usefulness of the TMJ Scale and that of Helkimo clinical dysfunction index used to investigate the relationship between orthodontic treatment and TMD in 100 orthodontic patients. The TMJ Scale was more useful; significant differences were observed in all the items of the TMJ Scale and in all the items except Palpation Pain and Chronicity of the Helkimo clinical dysfunction index.

The female patients in the symptom group particularly showed a higher degree of stress due to the chronicity of pain and abnormalities in TMJ than those in the non-symptom group. However, the male patients in the symptom group showed a lower degree of stress except with regard to joint disease. Only one item, JD, showed a significant difference in males. Perhaps they do not grasp the seriousness of their symptoms, because the pain degree may be lower than in the female subject group. Other clinical reports have indicated that the number of female subjective patients was greater than that of male patients[13]. Further research is needed on these issues.

The influence of psychosocial factors was less than that of physical factors in Japanese patients when comparing results with the cutoff value of American people; this may represent a cultural difference. The ST of the American normal score (by dot line) is higher than Japanese group. These findings suggest

that it is useful for treatment to differentiate and understand the degree and area of patients' subjective symptoms by using the TMJ Scale.

REFERENCES

1) Levitt, S.R., McKinney, M.W. and Lundeen, T.F. (1988). The TMJ Scale: Cross-validation and reliability studies. *J Craniomandibular Pract* **6**, 17–25.
2) Levitt, S.R., Lundeen, T.F. and McKinney, M.W. (1988). Initial studies of a new assessment method for temporomandibular joint disorders. *J Prosthet Dent* **59**, 490–495.
3) Levitt, S.R. (1990). Predictive vale of the TMJ scale in detecting clinically significant symptoms of temporomandibular disorders. *J Craniomandib Disord* **4**, 177–185.
4) Levitt, S.R., Spiegel, E.P and Claypoole, W.H. (1991). The TMJ scale and undetected brain tumors in patients with temporomandibular disorders. *J Craniomandibular Pract* **9**, 152–158.
5) Levitt, S.R. (1991). Predictive value: A model for dentists to evaluate the accuracy of diagnostic for tests for temporomandibular disorders as applied to a TMJ scale. *J Prosthet Dent* **66**, 385–390.
6) Lundeen, T.F. and Levitt, S.R. (1983). Discriminative ability of the TMJ scale: Age and gender differences. *J Prosthet Dent* **56**, 84–92.
7) Lundeen, T.F., Levitt, S.R. and McKinney, M.W. (1988). Clinical application of the TMJ scale. *J Craniomandibular Pract* **6**, 339–345.
8) Lundeen, T.F., Sturtevant, J.R. and Georgre, J.M. (1993). Stress as a factor in muscle and temporomandibular joint pain. *J Oral Rehabil* **10**, 187–196.
9) Lundeen, T.F. (1988). Evaluation of temporomandibular joint disorders by clinician ratings. *J Prosthet Dent* **59**, 202–211.
10) Lundeen, T.F. (1990). TMD symptomology among denture patients. *J Craniomandib Disord* **4**, 40–45.
11) Pamela, A.S. (1998). TMD treatment outcomes: A statistical assessment of the effects of psychological variables. *J Craniomandibular Pract* **16**, 138–142.
12) Pocock, P.R. (1992). Evaluation of an anamnestic questionnaire as an instrument for investigating potential relationships between orthodontic therapy and temporomandibular disorders. *Am J Orthod Dentofacial Orthop* **102**, 239–243.
13) Spiegel, E.P. and Levitt, S.R. (1990). Measuring symptom severity and treatment outcome of temporomandibular disorders with the TMJ scale: Case report. *J Craniomandibular Pract* **8**, 353–358.
14) Spiegel, E.P. and Levitt, S.R. (1991). Measuring symptom severity with the TMJ scale. *J Clin Orthod* **24**, 21–26.

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